REMARKS/ARGUMENTS

Claims 45-55 and 57-71 are pending. The claims are not amended. Applicants note with appreciation the indicated allowability of claims 51, 59, 61, and 71 if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 45-50, 52-55, 57, 58, 60, and 62-70 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Handique et al. (6,130,098).

Claims 45-50, 52-55, 57, 58, 60, and 62-70 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Handique et al. (6,130,098) in view of Wilding (5,587,128), or alternatively, over Wilding in view of Handique et al.

Applicants respectfully request reconsideration of these rejections in view of the following arguments, which as the Examiner requested, specifically address the valve disclosure of Handique et al. at column 12, lines 3-4 and 30-44; and column 16, lines 41-61.

Arguments for patentability of independent Claims 45 and 60 including specific consideration of the valve disclosure of Handique et al. at column 12, lines 3-4 and 30-44; and column 16, lines 41-61.

Column 12, lines 3-4 of Handique et al. states:

> FIGS. 12 (12a-j) is a schematic of one embodiment for manufacturing a sealable valve of the present invention.

Column 12, lines 30-44 of Handique et al. states:

> The present invention relates to microfabrication and biological reactions in microfabricated devices, and in particular, movement and mixing of biological samples in microdroplets through microchannels. The description of the invention involves I) the design of microscale devices (comprising microdroplet transport channels, reaction chambers, electrophoresis ports, and radiation detectors) using silicon and glass substrates, II) the creation (or definition) of microdroplets having

a discrete size, III) movement of discrete microdroplets using a surface-tension-gradient mechanism in which discrete microdroplets are differentially heated and propelled through etched channels, IV) flow control with sealed valves, and V) mixing of biological samples for reactions.

Column 16, lines 41-61 of Handique et al. states:

> The present invention contemplates the use of sealed valves to control fluid flow. While the present invention is not limited to a particular sealing method, in one embodiment, an actuating force pushes a diaphragm against a valve seat to restrict fluid flow and the diaphragm is then sealed to the valve seat. In such an embodiment, the solder pads are associated with a heating element that can melt the solder. This liquefied solder flows over areas of the valve seat and diaphragm to cover contamination, cracks and crooks between the diaphragm and valve seat. With the actuating force still holding the diaphragm and valve-seat together, the heating element is turned off to allow the solder to cool and re-solidify. Upon solidification, the actuating force can be released and the valve is sealed. To open the valve again, the solder can be liquefied without applying an actuation force. In a preferred embodiment, the valve is designed such that solder pads are placed on the diaphragm or valve seat. While the present invention is not limited to a precise method of placing these solder pads, it is specifically contemplated that they can be electroplated.

Handique et al. thus discloses that a diaphragm valve is known in the art and provides a description of one preferred type of diaphragm valve. This disclosure does not anticipate or suggest Applicants' invention as recited in claims 45 and 60. Stated another way, Applicants are not claiming that they invented the diaphragm valve, they are claiming the device and method recited in claims 45 and 60, and these claims are not anticipated or suggested by Handique et al. or the diaphragm valve discussed in column 12, lines 3-4 and 30-44; and column 16, lines 41-61.

In particular, Applicants respectfully submit that independent claim 45 is patentable over Handique et al. alone or in combination with Wilding because no combination of these references teaches a device having:

> at least one valve in the transition region for controlling fluid flow between the reaction chamber and the separation channel.

In Fig. 1, Handique et al. shows a device having a reaction chamber connected to an electrophoresis module, but no valve is shown in the region connecting the reaction chamber to the electrophoresis module. In fact, there are no valves shown in Fig. 1. Even though Handique et al. shows a sealable valve in another one of their devices (Fig. 13), this certainly does not teach that such a valve should be placed in the device of Fig. 1, because Handique et al. does not teach that there should be any valves in the device of Fig. 1.

Instead, Handique et al. **teaches away** from placing valves in the device of Fig. 1. In the section of the specification (col. 13, lines 61-66) following the description of Fig. 1, when describing how discreet droplets are created and moved through the device, Handique et al. teaches: "The present invention contemplates methods, compositions and devices for the creation of microdroplets of discrete (i.e., controlled and predetermined) size. The present invention contemplates the use of selective hydrophobic coatings to develop a liquid-sample injection and motion system that does not require the use of valves." Thus, Handique et al. fails to teach or suggest that there should be any valves in the device of Fig. 1, much less that there should be a valve in the transition region for controlling fluid flow between the reaction chamber and the separation channel, as explicitly recited in claim 45.

It does not matter if Handique et al. teaches a particular type of a diaphragm valve in Figs. 12a-j if no valves are present in the device of Fig. 1. Fig. 1 does not anticipate or suggest Applicants' claim 45 or 60. The place where Handique et al. does show the use of the valve of Figs. 12a-j is in the device of Fig. 13. In Fig. 13, Handique et al. shows a device that is different from Fig. 1. Fig. 13 shows a device having a valve in a side channel connecting to a main channel. This showing of a valve in a side channel in the device of Fig. 13 does not fairly

teach or suggest Applicants' device as recited in claim 45 because Handique et al. only teaches placing a valve in a side channel in the device of Fig. 13, which device lacks many of the other elements of Applicants' claim 45. There is no showing in Fig. 13, or anywhere else in Handique et al., of a valve in a transition region for controlling fluid flow between a reaction chamber and a separation channel, as recited in claim 45. Further, the placement of a valve in a side channel of the device of Fig. 13 does not teach or suggest the placing of a valve in the region of the different device of Fig. 1 that connects the reaction chamber to the electrophoresis module.

The Wilding reference also fails to teach or suggest a device having a valve in a transition region that connects a reaction chamber to a separation channel. Wilding therefore fails to remedy the shortcomings of Handique et al. in teaching Applicants' device as recited in claim 45. Thus, neither Handique et al. nor any combination of Handique et al. and Wilding disclose or suggest Applicants' invention as recited in claim 45.

Similarly, Applicants' claim 60 recites at least one valve in the transition region and the steps of subjecting the sample to a reaction while the valve remains closed and opening the valve in the transition region to allow injection of a sample plug into the separation region. Neither Handique et al. nor Wilding fairly teach or suggest these steps. Thus, neither Handique et al. nor any combination of Handique et al. and Wilding anticipate or suggest Applicants' invention as recited in claim 60.

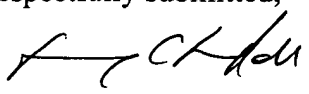
For at least the foregoing reasons, independent claims 45 and 60 and claims 46-59 and 61-71 depending therefrom are patentable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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